

# RECLAMATION

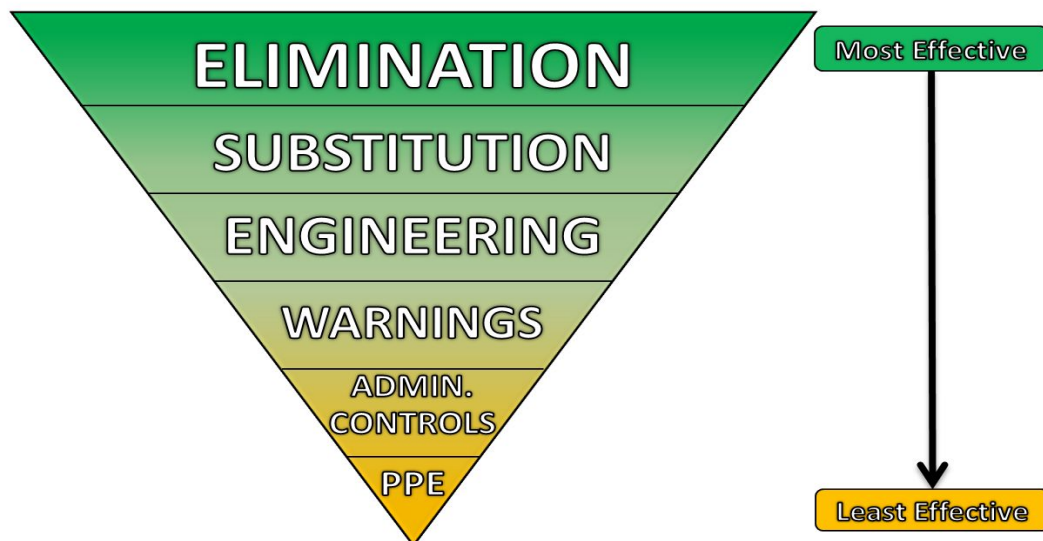
*Managing Water in the West*

Draft Report

## Hierarchy of Controls in the Reclamation Safety and Health Standards

Safety and Occupational Health Program Action Plan  
Team 21 Recommendations

### HIERARCHY OF CONTROLS



U.S. Department of the Interior  
Bureau of Reclamation

March 2015

U.S. DEPARTMENT OF THE INTERIOR

PROTECTING AMERICA'S GREAT OUTDOORS AND POWERING OUR FUTURE

The U.S. Department of the Interior protects America's natural resources and heritage, honors our cultures and tribal communities, and supplies the energy to power our future.

MISSION OF THE BUREAU OF RECLAMATION

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

# RECLAMATION

*Managing Water in the West*

Draft Report

## **Hierarchy of Controls in the Reclamation Safety and Health Standards**

Safety and Occupational Health Program Action Plan  
Team 21 Recommendations

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*Team 21 would like to thank our supervisors and our Executive Sponsor, Mike Ryan, for supporting us in this endeavor, and giving us the opportunity to participate in such an important effort.*



U.S. Department of the Interior  
Bureau of Reclamation

**March 2015**



## ACRONYMS

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Department	U.S. Department of the Interior
HoC	Hierarchy of Controls
JHA	Job Hazard Analysis
PPE	Personal Protective Equipment
Reclamation	U.S. Bureau of Reclamation
RSHS	Reclamation Safety and Health Standards
SOH	Safety and Occupational Health



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## BACKGROUND

In 2012, the U.S. Department of the Interior's (Department) Office of Occupational Safety and Health conducted a review of the U.S. Bureau of Reclamation's (Reclamation) Safety and Occupational Health (SOH) Program. Conclusion #1-2 of their December 2013 Evaluation Report states: "A degree of complacency exists in Reclamation that results in the acceptance of workplace hazards and contributes to the presence of uncorrected hazards, non-compliances, and incomplete SOH program implementation."

Reclamation established a Rapid Improvement Work Team to address concerns raised in the Department's review. This team identified that, "Organizationally, we are not consistently recognizing hazards and properly assessing risk... before doing the job."

In Reclamation's May 2014 SOH Action Plan, Program Action Plan Teams were created to address the deficiencies documented in the Evaluation Report. Team 21 was given the assignment to "*Reflect the concept of Hierarchy of Controls in the Reclamation Safety and Health Standards (RSHS).*"

Team 21 reviewed the concept of Hierarchy of Controls (HoC) and evaluated the RSHS to determine options for how to best incorporate HoC to further reduce, and possibly, eliminate safety hazards in the workplace. Section 2 (General Requirements) and Section 4 (Work Planning) of the RSHS were deemed the most appropriate areas for inclusion of this concept.

This report documents Team 21's recommendations.

# RECOMMENDATIONS

Team 21 proposes the Reclamation Leadership Team approve the following five recommended modifications to the RSHS:

## **Recommendation #1 – Add Topic 2.9 – Hierarchy of Controls to Section 2 (General Requirements)**

Proposed Addition:

### **2.9 Hierarchy of Controls**

Hierarchy of Controls (HoC) is a system used to reduce the severity of hazards in the workplace. Using HoC ensures the most current, effective, and economically feasible methods for hazard avoidance are considered.

After hazards have been identified through Hazard Assessments, HoC is used to analyze and address each hazard through the following approach (recognizing that a combination of the HoC measures below may be most appropriate):

- Elimination
- Substitution
- Engineering
- Warning Systems
- Administrative Controls
- Personal Protective Equipment (PPE)

Elimination is the most effective control, and therefore evaluation should take place to determine whether this outcome is feasible. If elimination is not feasible, then substitution should be examined next. This process continues until all possible controls have been exhausted, and PPE is the only remaining control. Figure 2-1 is a visual representation of the process.

# HIERARCHY OF CONTROLS

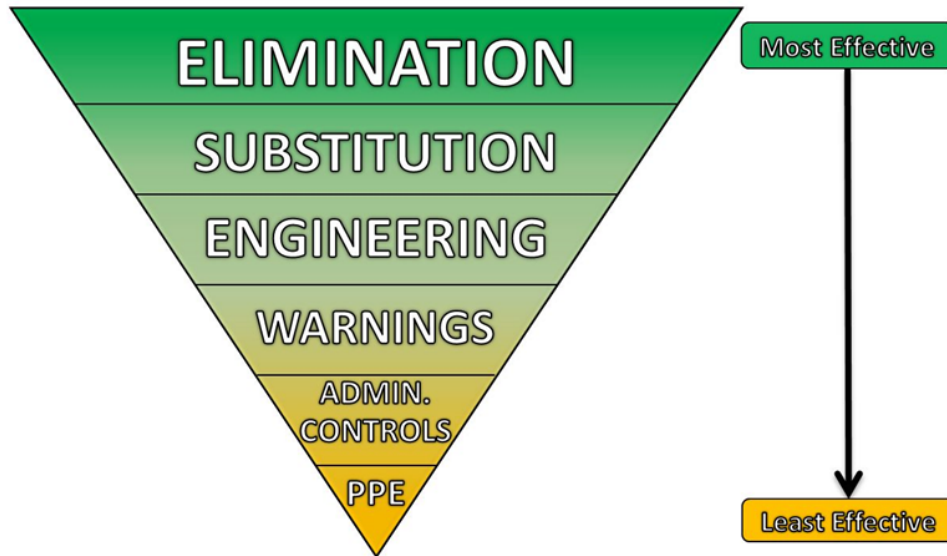


Figure 2-1. Hierarchy of Controls

It is management's responsibility, with employee input, to assess the workplace and work activities to determine if hazards are likely to be present, and ensure the most appropriate control measures are implemented. It is the employee's responsibility to use the control measures identified.

## 2.9.1 Elimination

Elimination focuses on removing the hazard, thereby eliminating the risk. Example: Remove a dangerous machine from service.

## 2.9.2 Substitution

Substitution focuses on replacing the hazard with something less hazardous, thereby reducing the risk. Example: Replace a dangerous machine with a safer machine.

## 2.9.3 Engineering

Engineering focuses on isolating the individual from the hazard, thereby reducing the risk. Example: Attach guards to a machine to protect individuals.

#### 2.9.4 *Warning Systems*

Warning Systems focus on alerting the individual to the hazard, thereby raising awareness of the risk. Example: Add warning lights or sirens to alert employees before and when a machine is being used.

#### 2.9.5 *Administrative Controls*

Administrative Controls focus on lessening exposure to hazards through appropriate procedures, training, and postings. Example: Provide instruction to operate a machine safely.

#### 2.9.6 *Personal Protective Equipment*

Personal Protective Equipment (PPE) focuses on protective measures rather than preventative measures by requiring individuals to wear protective gear when working with known or potential hazards. Example: Wear hearing protection when operating a machine.

For additional information on HoC as it relates to Work Planning, see Section 4.

### **Recommendation #2 – Edit Introductory Narrative in Section 4 (Work Planning)**

#### **RSHS Current Version:**

This section sets forth the requirements of work planning. It includes hazard assessment, job hazard analysis, communications, emergency response plan, and lightning hazards. This section applies to all Reclamation and contractor activities.

#### **Proposed Change:**

This section sets forth the requirements of work planning. It includes Hazard Assessments, Hierarchy of Controls (HoC), Job Hazard Analysis (JHA), Communications, Emergency Response Plan, and Lightning Hazards. This section applies to all Reclamation and contractor activities.

### **Recommendation #3 – Edit Topic 4.1 – Hazard Assessments in Section 4 (Work Planning)**

#### **RSHS Current Version:**

The responsible supervisor, consulting with a safety or health professional if needed, must assess the workplace and work activities to determine if hazards are present or are likely to be present. The supervisor must develop a written Job Hazard Analysis (JHA) if warranted by

identified or potential hazards. If there is potential exposure to any chemical, physical, or biological agent which may have a detrimental effect, the supervisor must ensure that a health hazard assessment is included in the JHA.

### **Proposed Change:**

Although a certain level of risk is inherent to most industrial and environmental related work, Hazard Assessments are important in understanding risks to employees' health and safety. The responsible supervisor, with employee input, must assess the workplace and work activities to determine if hazards are likely to be present. Reviewing past activities to determine previously identified hazards and the associated mitigation will allow us to learn from past experiences.

The awareness of potential risks and hazards, the ability to recognize them when they occur, and the willingness to verbalize them as they are presented will create a safer environment for all employees.

## **Recommendation #4 – Add New Topic 4.2 – Hierarchy of Controls to Section 4 (Work Planning)**

### **Proposed Addition:**

#### **4.2 Hierarchy of Controls**

After hazards have been identified through Hazard Assessments, the determination of how to address each hazard is undertaken through HoC. When working through the HoC process, it is important to consider the probability of a hazard occurring, and the severity of the consequences. A risk assessment matrix can be a valuable tool to aid management in determining an appropriate course of action.

The responsible supervisor, with employee input, shall review each identified hazard through the HoC process, from the most effective control (elimination) to the least effective solution (PPE). Caution should be exercised that HoC solutions do not introduce other hazards.

Prior to the HoC process, significant improvements in employee safety can be achieved by addressing hazards in the design phase (Prevention through Design). By eliminating or reducing hazards during the design phase (“designing out”), before employees are exposed to a work activity, risks associated with processes and equipment can be significantly reduced. This practice can also be a cost-effective manner to approach employee safety in the workplace.

For additional information on HoC, see Section 2.

## **Recommendation #5 – Edit Topic 4.2 – Requirements for Job Hazard Analysis to include an Introductory Narrative in Section 4 (Work Planning)**

Proposed Change:

### **4.3 Job Hazard Analysis**

After hazards are identified through Hazard Assessments and the HoC process is applied, a written JHA shall be developed to address any remaining hazards.

[Resume with current version of RSHS book left off – see original Topic 4.2.1]

## CONCLUSION

Team 21 proposes the Reclamation Leadership Team approve the following five recommended modifications to the RSHS:

1. Add Topic 2.9 - Hierarchy of Controls to Section 2 (General Requirements).
2. Edit the introductory narrative in Section 4 (Work Planning).
3. Edit Topic 4.1 - Hazard Assessments in Section 4 (Work Planning).
4. Add Topic 4.2 - Hierarchy of Controls to Section 4 (Work Planning).
5. Edit Topic 4.2 - Requirements for Job Hazard Analysis in Section 4 (Work Planning).

This recommendation involves changing the current title, renumbering the topic to 4.3, and adding an introductory narrative. Note: By implementing Recommendation #4 above, the current numbering of Section 4 (Work Planning) will change sequentially.

Team 21 believes the proposed RSHS edits related to HoC will directly address the identified “complacency” and “acceptance of workplace hazards” identified in Department’s Office of Occupational Safety and Health Evaluation Report, by ensuring Reclamation consistently recognizes hazards and properly addresses risk before every work activity.

These recommendations were shared with the following Reclamation-wide teams and individuals for their review and comment:

- Team Leads from the other SOH Action Plan Teams;
- Reclamation’s SOH Council;
- The Reclamation Design and Construction Coordination Team;
- The Reclamation Partnership Council; and
- SOH Professionals and employees throughout Reclamation.

Team 21’s review process enabled an accumulation of perspectives across all regions, types of office (Denver Office, Regional Office, Area Office, Field Office, and Facility), and occupational disciplines.

All comments received were discussed by Team 21, and many were included in the final recommendations presented in this report. The comments received indicated an overwhelming sentiment that the inclusion of HoC in the RSHS is needed and that these recommendations represent a strong step forward in changing the safety culture within Reclamation.